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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/964,739	09/28/2001	Woong Kwon Kim	043694-5015-03	2171

9629 7590 07/29/2004

MORGAN LEWIS & BOCKIUS LLP
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EXAMINER

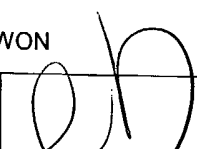
HON, SOW FUN

ART UNIT	PAPER NUMBER
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1772

DATE MAILED: 07/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/964,739	KIM, WOONG KWON	
	Examiner	Art Unit	
	Sow-Fun Hon	1772	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04/14/04.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3,5-9,11,13-17 and 20-22 is/are pending in the application.
- 4a) Of the above claim(s) 17 and 20-22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3,5-9,11,13-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date: _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date: _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

Withdrawn Rejections

1. The 35 U.S.C. 112, 1st paragraph rejections have been withdrawn due to Applicant's clarification that the method of etching is indeed chemical etching, and to Applicant's amendment dated 04/14/04.

Rejections Repeated

2. The 35 U.S.C. 103(a) rejections have been repeated for the same reasons previously of record in the Office action dated 01/15/04.

Response to Arguments

3. Applicant argues that Kitayama only shows a glass substrate manufacturing method applicable to magnetic recording disk glass substrates.

Applicant is respectfully apprised that Kitayama shows a glass substrate manufacturing method applicable to liquid crystal display device (LCD) glass substrates as well (abstract).

4. Applicant argues that Kityama only teaches that a glass substrate is chemically changed to create compressive stress in its outer layer, and does not teach that an outside protective layer imparts a compressive stress to the glass substrate.

Applicant is respectfully reminded that by teaching that the glass substrate is chemically changed to create compressive stress in its outer layer in order to balance out the internal tensile stress (column 6, lines 60-65), Kitayama has provided the protective mechanism which enables

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one of ordinary skill in the art to use routine experimentation to provide an alternate protective layer with compressive stress on the outside of the glass substrate, in lieu of the outer layer of the glass substrate.

5. Applicant argues that Kimock makes it clear that ion bombardment of the parent substrate allows for at least one interlayer to be bonded to the parent substrate for a subsequent diamond like carbon layer to be successfully bonded on top of the interlayer because applying the DLC coating directly to the glass substrate results in poor adhesion, and [is therefore not relevant art].

Applicant is respectfully apprised that Kimock also teaches that the reaction between the SiO_2 in the glass and the carbon layer (DLC) is essential for the coating to exhibit excellent adhesion. Kitayama et al. teaches that a silica (SiO_2) layer is equivalent to a carbon layer (column 10, lines 50-55) in terms of functioning as a protective layer. Kinock teaches that the etching of the glass substrate allows for the SiO_2 layer to be deposited on the glass substrate (column 12, lines 30-40) for good adhesion before deposition of the carbon layer. As discussed above, Kitayama has already provided the protective mechanism, by teaching that the glass substrate is chemically changed to create compressive stress in its outer layer in order to balance out the internal tensile stress (column 6, lines 60-65). This teaching enables one of ordinary skill in the art to use routine experimentation to provide a separate protective layer with the balancing compressive stress on the outside of the glass substrate in lieu of the outer layer of the glass substrate.

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6. Applicant argues that Kimock teaches only that the DLC carbon layer is under compressive stress, not that the DLC layer imparts a compressive stress to the outer surface of the parent substrate.

Applicant is respectfully apprised that when an overlying connecting layer is under significant compressive stress, the compressive stress is transmitted via the connecting interface between the overlying layer and the connecting layer under it. Kimoch teaches that etching of the parent surface provides good adhesion for deposition of the SiO₂ layer on the parent surface (column 12, lines 33-40), and that ion beam deposition (column 12, lines 35-40) provides a coating with (under) a highly compressive stress (column 1, lines 50-55). This teaching enables one of ordinary skill in the art to use routine experimentation to provide a separate protective layer containing the balancing compressive stress on the outside of the glass substrate of Kitayama, with the interlayer adhesion necessary to transmit the compressive stress to the glass substrate, in order to balance out the internal tensile stress of the glass substrate.

7. Applicant argues that the DLC layer is not in tension and therefore cannot impart compressive stress to the outside surface of a glass substrate.

Applicant is respectfully directed to the discussion above, which details how the compressive stress can be transmitted to the outside surface of a glass substrate.

8. Applicant's arguments against the rejection containing Mizuta, are directed against the validity of the combination of Kitayama in view of Kimock, which are addressed above.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication should be directed to Sow-Fun Hon whose telephone number is (571)272-1492. The examiner can normally be reached Monday to Friday from 10:00 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harold Pyon, can be reached at (571)272-1498. The fax phone number for the organization where this application or proceeding is assigned is (703)872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

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system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SH

Sow-Fun Hon

07/20/04

[Signature]
HONG L. PYON
SUPERVISORY PATENT EXAMINER
1772

7/23/04